

**Biological Control of the Euonymus Scale *Unaspis euonymi*
(Homoptera: Diaspididae)
Using *Cybocephalus nipponicus* (Coleoptera: Nitidulidae)**

Annual Report

2000

Prepared by:

**Wayne Hudson
Thomas Scudder
Thomas Dorsey
George Robbins
Mark Mayer**



**Division of Plant Industry
Phillip Alampi Beneficial Insect Laboratory**

Introduction

The euonymus scale *Unaspis euonymi* (Homoptera: Diaspididae) is a serious pest on a number of Euonymus plant species throughout the United States. Commonly grown species that are frequently attacked are: *Euonymus bungeanus*, *E. europaeus*, *E. fortunei*, *E. hamiltonianus*, *E. japonicus*, and *E. kiautschovicus*. The euonymus scale (Figure 1), probably introduced from Japan or China, can cause complete defoliation and death of the plants. An early symptom of attack is the appearance of yellow or white spots on the leaves. In some cases the damage is not readily apparent, but in a severe infestation the leaves may drop and subject the plants to stress or death. Economically, euonymus plants are important in the landscape industry. Holmes and Davidson (1984) ranked euonymus twelfth out of the twenty most commonly used landscape plants. The USDA's agricultural census data show annual sales in excess of \$17,000,000. The scale infests over 50% of the plants encountered in the landscape in NJ. This fact has been particularly apparent along the shore region of the state, where euonymus is a popularly planted ornamental species. The object of this program is to establish *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) (Figure 2) throughout the state to control the euonymus scale.

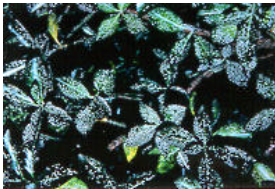


Figure 1. Scale-Infested Euonymus Plant



Figure 2. *Cybocephalus nipponicus*

In 2000, PABIL personnel continued to release *C. nipponicus*, the small exotic predatory beetle from Korea that feeds on *U. euonymi*. A total of 121,500 beetles were released in 41 new sites in 2000. Surveys conducted at the previous 164 release sites made from 1996-1999 (Appendices 1-4) resulted in 109 recoveries of *C. nipponicus* indicating that the insect has well established itself in the state. A total of 280 sites have received releases since the beginning of the New Jersey Department of Agriculture's program in 1995.

Materials and Methods

During 2000, distribution surveys for all released beneficial insect species were carried out at sites in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Middlesex, Morris, Monmouth, Ocean, Salem, Somerset, Sussex and Warren counties. In 2000 PABIL staff continued to release *C. nipponicus* (Table 3) in an effort to further establish this insect and continue to broaden its range statewide. Phillip Alampi Beneficial Insect Laboratory staff continued to monitor and if necessary, make supplemental releases in previous release sites. The success of PABIL's rearing program allowed for both increased numbers of insects and earlier, more frequent releases. Before *C. nipponicus* was reared at the laboratory, releases came from the Niles, Michigan Laboratory of the USDA that was supplying multiple states. Because of this, field personnel were able to place *C. nipponicus* into the landscape sooner and in greater numbers than in the past. A list of release sites may

be found for the years 1995-1999 (Appendices 1-4). This allowed *C. nipponicus* a longer period of time to feed, reproduce, and adapt to its new environment. Together, these factors combined to increase the establishment of *C. nipponicus* within the state.

Results and Discussion

Tables 1 and 2 show the summary of the releases, recoveries, and documented establishment made since the PABIL has started its distribution and establishment program. The tables show that *C. nipponicus* is still present at the initial release sites and continues to reduce and eliminate the scale population on the plants. In addition it should also be noted that *C. nipponicus* was present in 81.1% of the sites that were visited. *Chilocorus kuwanae* (Coleoptera: Coccinellidae), a lady beetle released in the 1980's was also present in 21.5% of the visited release sites, which along with *C. nipponicus* is working to reduce the sites with high scale populations.

Table 1. *Cybocephalus nipponicus* (Coleoptera:Nitidulidae) Releases 1995-2000

Year	# Released	# of Release Sites
1995	4475	7 (7)
1996	10855	23 (21)
1997	70731	46 (42)
1998	92475	68 (64)
1999	174800	85 (74)
2000	121500	51 (41)
Total	474836	280 (249)

Number in parenthesis () are the number of new release sites for the year

Table 2. *Cybocephalus nipponicus* (Coleoptera:Nitidulidae) Recoveries from 1995-1999 release sites visited in 2000

Year	Counties	# of sites	# of sites with recoveries	% of sites with recoveries
1995	4	2	2	100
1996	10	9	5	55.5
1997	13	24	18	75
1998	10	38	32	84.2
1999	13	59	50	84.7
Total		132	107	81.1

Table 3 shows the department's increased effort to distribute *C. nipponicus* throughout the state. The program to date has released at 280 sites in 16 of New Jersey's 21 counties for a total of 474,836 *C. nipponicus*.

Recoveries of *C. nipponicus* have been made up to 1/2 mile from one of the release sites.

Table 3. *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) Releases 2000

Yr. Released	County	Site	# Cy Released
2000	Atlantic	Waterfront Restaurant	3500 *
2000	Atlantic	Footmark Shoes	4000
2000	Atlantic	Kingdom Hall	2000
2000	Atlantic	Surfside Casual	1500 *
2000	Burlington	Burlington Co. College	2500 *
2000	Burlington	Tabernacle Rainsoft Water Treatment	1000
2000	Burlington	249 Tuckerton Rd.	1000
2000	Camden	Hudson United Bank Haddon Hgts.	1000
2000	Cape May	South Jersey Marina	4000
2000	Cape May	The Anchorage Inn	2000
2000	Cape May	Montreal Inn	5000
2000	Cape May	Ocean Restaurant	2500
2000	Cape May	Coldwell Bankers wildwood Crst.	1000
2000	Cape May	Creast Memorial School Wildwood Crst.	1000
2000	Cape May	Duffinetti's	1000
2000	Cape May	Nomad Motel	500
2000	Cape May	Seacreast Inn	5000
2000	Cape May	Seaville Inn	3500
2000	Cape May	Avalon Police Dept	12000
2000	Cape May	Clarke's Market	1000
2000	Cape May	Bay Shore Rd. and Washington Ave.	1000
2000	Cape May	Fleet Bank	500
2000	Cape May	West Marine	1000
2000	Cape May	Fox Park Athletic & Davis Ave.	2000
2000	Cape May	Oceanside Realty	500
2000	Cape May	Universal Supply Co.	1000
2000	Cape May	9 South Center Rt. 9	1500
2000	Cape May	AAA Rt. 9 Burleigh	2000
2000	Cape May	Ferrell Realty	3000
2000	Cape May	JFK Blvd Media Planting Sea Isle	5000
2000	Cape May	Kiwannis Park Tennis Courts	3000 *
2000	Cape May	Forum Motor Inn	1000
2000	Cumberland	Hoffman's Funeral Home	1000
2000	Cumberland	Ball & Foster Glass Co.	5000 *
2000	Gloucester	Carr Tunn Up	1000
2000	Gloucester	Sewell Fire Co.	2000
2000	Gloucester	Best Western Hotel Grove Rd.	2000
2000	Hunterton	Wickecheoke Reserve (Hemlock)	2500
2000	Mercer	127 Mirybrook Rd.	250
2000	Mercer	Princeton Battle Field (Florinia scale)	2500
2000	Mercer	126 Summit Ave.	750
2000	Mercer	17 Cannon Dr.	1000
2000	Mercer	Veterans Park	5000 *
2000	Monmouth	Our Lady Star of the Sea	4000 *
2000	Monmouth	Saint Andrews Church	1000 *
2000	Monmouth	Wendy's Rt. 9 & Taylors Mill Rd.	1000

Table 3.
continued

2000	Monmouth	Berkley-Carteret Hotel	3500 *
2000	Monmouth	Beachview Condos.	4000 *
2000	Salem	Salem Boat Exchange	1000
2000	Somerset	Pizza Hut Rt. 22 & Warrenville Rd.	2500
2000	Sussex	Allamuchy State Park	5000
Totals		51	121500

* supplemental release

CONCLUSION

C. nipponicus continued to demonstrate its ability to adapt to the climatic conditions of New Jersey. It was still being recovered at 1995 and 1996 release sites. The success of the laboratory's rearing program, which provided increased numbers since 1996 and allowed for timely releases of the insect, contributed greatly to its success. Releases of *C. nipponicus* continued in 2000 to firmly establish this predator throughout the state.

C. kuwanae is increasing its population and establishing well in New Jersey.

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Appendix 1. *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) Releases and Recoveries 1995 and 1996

Yr. Released	County	Site	# Cy Released	1996	1997	1998	1999	2000	<i>C. kuwana</i>
1995	Burlington	1120 Exec. Plaza	900	yes	yes	no	no visit	no	
1995	Cape May	Cape May Zoo	1600	yes	yes	yes	yes	yes	
1995	Mercer	1304 River Road	400	no	no	a			
1995	Mercer	Cadwalder Park	410	yes	no	b	a		
1995	Mercer	Old STS Store	565	no	no	a			
1995	Mercer	Mercer County RCE	200	no	no	a			
1995	Middlesex	Rutgers Display Gardens	400	no	yes	no	yes	yes	
Totals		7	4475	3	3	1	2	2	0

Yr. Released	County	Site	# Cy Released	1997	1998	1999	2000	<i>C. kuwana</i>
1996	Atlantic	St. Elizabeth Church	500	yes	yes	yes	yes	
1996	Atlantic	Surfside Casual Furniture Store	500	yes	yes	yes	yes	
1996	Camden	Park Place Condos.	500	yes	no	no visit	no *	yes
1996	CapeMay	Cape May Zoo	375	yes	yes	yes	yes	
1996	Gloucester	Freezer & Cold Storage	500	yes	yes	yes	yes	
1996	Hunterdon	1055 Old York Rd.	500	yes	c			
1996	Hunterdon	Hunterdon City Govt, Complex	500	yes	yes	yes	no	
1996	Mercer	Scotch Rd. Plaza	250	c				
1996	Mercer	Kingsbrook County Estates	250	no	a			
1996	Mercer	8 Van Gough Ct Mercer Princeton Collection	250	no	a			
1996	Middlesex	Developement	250	no	a			
1996	Middlesex	Rutgers Display Gardens	500	yes	no	yes	yes *	
1996	Monmouth	22 S. Main St.	380	no	no	no visit	no visit	
1996	Monmouth	Hominy Hill Golf Course	250	no	no	no visit	no visit	
1996	Monmouth	Monmouth Museum	250	no	a			
1996	Monmouth	Deep Cut Park	250	no	a			
1996	Monmouth	Vietnam Memorial	750	yes	yes	a		
1996	Ocean	814 Miller Ave	500	yes	yes	yes	no	
1996	Ocean	Beacon Garden Apts.	750	yes	no	yes	yes	yes
1996	Ocean	Mrs. Walkers Ice Cream Shop	750	yes	yes	yes	no	yes
1996	Ocean	Brick Professional Complex	500	no	a			
1996	Ocean	Southern Regional High School	750	yes	yes	yes	yes	
1996	Somerset	Colonial park	850	yes	no	no visit		
Totals		23	10,855	12	7	8	7	3

a-plants free of scale, b-plants severely pruned, c-plants were removed after release

*supplemental release

Appendix 2. *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) Releases and Recoveries 1997

Yr. Released	County	Site	# Cy Released	1998	1999	2000	<i>C. kuwana</i>
1997	Atlantic	Seaview Professional Complex	250	no	yes	yes	
1997	Atlantic	Village Green Shops	1250	yes	yes	no	
1997	Atlantic	Seaview Harbor Developement	1500	yes	yes	yes	
1997	Atlantic	Longport Inn	500	yes	yes	yes	
1997	Atlantic	Brigantine M.M.S.C.	13500	yes	yes	yes	
1997	Atlantic	Brandywood Condos.	500	no	no	no	
1997	Atlantic	Corbin City Municipal Bldg.	500	yes	no	no	yes
1997	Burlington	Growers Co-op	500	d			
1997	Burlington	Executive Days Inn	500	yes	yes	no	yes
1997	Burlington	Cookstown Exxon	30		yes	yes	
1997	Cape May	Golden Inn	500	yes	a	yes	
1997	Cape May	Cape May City Govt. Complex	5500	yes	b	no	
1997	Cape May	Trinity Methodist Church	500	yes	yes	yes	
1997	Cape May	Gande Woods Mobile Home Park	500	yes	c	d	
1997	Cape May	Landis ave Condos. Sea Isle	500	yes	yes	yes	
1997	Cape May	Stone Harbor Minicipal Complex	500	yes	yes	yes	
1997	Cape May	Wildwood Welcome Center	500	yes	yes	yes	
1997	Cape May	Wildwood Crest Tennis Courts	250	yes	yes	yes	
1997	Cape May	483 Hagen Rd.	500				
1997	Cape May	6th & West Ave Ocean City	2500	yes	b	d	
1997	Cape May	Stone Harbor Marina	500	yes	yes	yes	
1997	Cape May	Gardner Hardware Store	1000	c			
1997	Cape May	Cape May Zoo	12500	yes	yes	yes *	
1997	Cumberland	Deola Farms	7451	no	e		
1997	Gloucester	Freezer & Cold Storage Co.	1250	yes	yes	yes *	
1997	Hunterdon	Calvary Bible Church	500	yes	yes	no	yes
1997	Hunterdon	Clinton Shammy Shine	500	no	no visit		
1997	Mercsr	Trenton Country Club	3250		yes	yes	yes
1997	Middlesex	1329 Aaron Rd. North Brunswick	250				
1997	Middlesex	Tubesales Inc.	500	yes	a		
1997	Monmouth	Tamarack Self Storage	500	yes	yes	yes	yes
1997	Monmouth	Berkley-Cartetet Hotel	500	yes	yes	yes	yes
1997	Monmouth	St. Andrews Methodist Church	500	yes	no	no	
1997	Monmouth	615 New York Ave	500	no	no	no	
1997	Monmouth	Hominy Hill Golf Course	500	no	no visit	no visit	
1997	Ocean	Beacon Garden Apts.	2500	c	yes	yes *	
1997	Ocean	Gilbert Insurance Co.	1000	yes	c		
1997	Ocean	10th & Central Ave	500	no	no	yes	
1997	Ocean	New Horizon Diner	500	yes	c		
1997	Ocean	J&R Insurance Co.	750	no	no	no	
1997	Ocean	Eaglewood Mobile Homes	500	yes	c		
1997	Ocean	Tuckerton Landmark Commission	750	yes	c		
1997	Ocean	Port Hole Cafe	500	yes	yes	yes	
1997	Ocean	Southern Regional High School	1500	yes	yes	yes *	
1997	Somerste	Somerset Shopping Center	500	yes	no visit		
1997	Sussex	Lockwood Farms Garden Center	500	yes	a		
1997	Warren	Doctors Park Office Complex	500	yes	yes	yes	yes
	Total	46	70731	29	19	20	7

a-plants free of scale, b-plants severely pruned, c-plants removed after release, d-plants removed found on adjacent plant e-site sprayed
 *supplemental releases

Appendix 3. *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) Releases and Recoveries 1998

Yr. Released	County	Site	# Cy Released	1999	2000	<i>C. kuwana</i>
1998	Atlantic	Brigantine Ice Cream	500	yes	yes	
1998	Atlantic	Sandra King Pleasantville	1500	no visit	no	
1998	Atlantic	Emilio's Pizzeria	500	no	yes	
1998	Atlantic	Laurel Dale Fire Co.	500	c		
1998	Atlantic	Budget Inn	6000	yes	a	
1998	Atlantic	Smithville	500	no	no	
1998	Atlantic	Village Green Shops	2000	yes	b	
1998	Atlantic	Mossmann Business Machines	5000	yes	yes	
1998	Burlington	Medport Diner	250	yes	a	
1998	Burlington	Richard Ransom	1000	no visit	no visit	
1998	Burlington	Commerce Bank	1000	c		
1998	Burlington	Greentree Place	1500	yes	a	
1998	Burlington	Pic-A-Lilli	1000	yes	yes	
1998	Burlington	Mastori's Prof. Bldg.	500	yes	a	
1998	Burlington	Heidelberg Press	1000	yes	yes	yes
1998	Camden	New Holland Floral	125	no visit	a	
1998	Camden	Berlin War Memorial	375	e		
1998	Camden	Brooklawn Diner	1000	yes	yes	
1998	Cape May	Paisano's Pizza	500	yes	no	
1998	Cape May	Sports-n-Stuff Outlet	500	yes	yes	yes
1998	Cape May	Villa Maria By The Sea	1000	c		
1998	Cape May	Bayside Eye Center	500	yes	yes	
1998	Cape May	Greencreek Fire Co.	500	yes	yes	
1998	Cape May	Wildwood Creast Tennis Courts	500	yes	yes *	
1998	Cape May	Unimin Sand & Gravel	500	no	yes	
1998	Cape May	Rodia Used Furniture	500	yes	yes	
1998	Cape May	Ocean City Airport	5000	yes	yes	
1998	Cape May	Sea Isle City Hall	500	yes	yes	
1998	Cape May	Ocean City Holy Trinity Church	500	yes	yes	
1998	Cape May	Ocean City Hobby Horse Ice Cream	500	yes	yes	
1998	Cape May	Richards Rental Agency O.C.	500	yes	yes	
1998	Cape May	R&J Contractors	1000	yes	yes	yes
1998	Cape May	Dias Creek Exterminators	1000	no	yes	yes
1998	Cape May	D&B Printing O.C.	4000	yes	d	
1998	Cape May	Wildwood Welcome Center	3000	yes	yes *	
1998	Cape May	Canyon Club	1000	yes	yes	yes
1998	Cape May	Mangia-Mangia Rest.	1500	yes	c	
1998	Cape May	Kiwannis Park/Tennis Courts	1000	yes	yes	
1998	Cape May	Hardbodies Gym	5500	yes	yes	
1998	Cape May	Trinity Church Marmora	1500	yes	yes *	
1998	Cape May	Cape May PNC Bank	1000	yes	yes	yes
1998	Cape May	Avalon Welcome Sign	1000	yes	yes	
1998	Cape May	Mount Vernon	1500	yes	yes	
1998	Cape May	Marianist Family Retreat	1000	yes	a	yes

1998	Cape May	Charles Kerner	1000	yes	b	yes
1998	Cape May	Higbees Beach #525	1000	yes	yes	
1998	Cumberland	Wawa Mauricetown	6000	yes	yes	
1998	Cumberland	Maranatha Baptist Church	500	yes	a	
1998	Cumberland	Ball & Foster Millville	4000	yes	yes	
1998	Gloucester	Gloucester Co. Video	500	yes	yes	yes
1998	Gloucester	Deptford M.U.A.	125	yes	yes	
1998	Gloucester	West Deptford Middle School	500	yes	yes	
1998	Gloucester	Josh Frecon	1000	no visit	no visit	
1998	Gloucester	Capt-n-Cat	1000	yes	no	
1998	Gloucester	Amechi Car Wash	500	yes	b	
1998	Gloucester	North Pole Gift Shop	500	c		
1998	Mercer	Beth Alessi	1000	no visit	no visit	
1998	Mercer	Veterans Park	4000	yes	yes *	
1998	Mercer	Mudd Library	1500	yes	no visit	yes
1998	Middlesex	Durham Center Edison	1100	yes	no visit	
1998	Monmouth	Shin Alternators	500	no	no	yes
1998	Monmouth	Busy B's Laundromat	1000	yes	no	yes
1998	Ocean	Eaglewood Mobile Homes	1000	c		
1998	Ocean	Tuckerton Landmark Commission	1000	c		
1998	Ocean	Castle Woodcraft	500	yes	yes	yes
1998	Ocean	Leisure Village	1500	no visit	no visit	
1998	Ocean	Lakehurst Post Office	2500	yes	c	
1998	Ocean	2 Blanche Drive New Egypt	500	yes	yes	yes
Total			68	92475	50	33
						14

a-plants free of scale, b-plants severely pruned, c-plants removed after release, d-plants removed found on adjacent plant e-site sprayed

- supplemental releases

Appendix 4. *Cybocephalus nipponicus* (Coleoptera: Nitidulidae) Releases 1999

Yr. Released	County	Site	# Cy Released	2000	<i>C. kuwana</i>
1999	Atlantic	Heritage Park	2500	yes	
1999	Atlantic	Water Front Restaurant	500	yes	
1999	Atlantic	Cita Del Mare Restaurant	1000	yes	
1999	Atlantic	Joe's Seaside Market	1500	yes	
1999	Atlantic	Budget Inn	4000	e	
1999	Atlantic	Brigantine Beach Club	1500	yes	
1999	Atlantic	Summit Bank	500	no	
1999	Atlantic	Remax Realtors	1000	yes	
1999	Atlantic	Days Inn	1500	yes	yes
1999	Atlantic	Brigantine Ice Cream Parlor	3500	yes *	
1999	Burlington	Vincetown Diner	1000	a	
1999	Burlington	Medport Diner	500	a	
1999	Burlington	Burlington County College Student Center	4000	no	yes
1999	Burlington	Route 70 Pizza Hut	1000	yes	
1999	Burlington	Strip Mall Beverly Rancocas Road	5000	b	
1999	Camden	West Collingswood Heights Fire House	1000	yes	
1999	Camden	#404 New Jersey Ave. Krupinski	1500	yes	
1999	Camden	New Strength Gospel Church Nicholson Road	500	yes	
1999	Cape May	WaWa Bayshore Road	1500	yes	
1999	Cape May	Lower Township Municipal Building	1000	yes	

1999	Cape May	D&B Printing	4500	d *	
1999	Cape May	Bayside Eye Center	1500	yes *	
1999	Cape May	Lobster House	2000	yes	
1999	Cape May	Mount Vernon Motel	2500	yes *	yes
1999	Cape May	Stone Harbour Community Board	500	yes	
1999	Cape May	Mangia-Mangia Restaurant	1000	c	
1999	Cape May	Sea Isle City Hall Parking Lot	500	yes	
1999	Cape May	Dunkin Donuts & Rainbow Ice Cream	5500	yes	
1999	Cape May	United Methodist Church	1000	yes	
1999	Cape May	Pirate Island Mini Golf	5000	yes	
1999	Cape May	Meineke Muffler	500	yes	
1999	Cape May	Womens Civic Club	2000	yes	
1999	Cape May	Sea Mist Condos	2000	yes	
1999	Cape May	96th Street Comfort Station	1000	yes	
1999	Cape May	Green Creek Fire Company	1000	yes *	
1999	Cumberland	Ball & Foster	5000	yes *	yes
1999	Gloucester	W. Deptford Middle School	1000	yes *	
1999	Gloucester	Sunflower Christian Care Church	500	yes	yes
1999	Gloucester	The Court At Deptford in front of Circuit City	1000	yes	
1999	Gloucester	Logans Liquor's	2000	yes	
1999	Gloucester	Deptford M.U.A.- Rte 47	500	yes *	
1999	Mercer	127 Miny Brook Road	1000	no visit	
1999	Mercer	Mudd Library	5000	no visit *	
1999	Mercer	Princeton Mortgage	1000	no	
1999	Mercer	Windsor Floor Covering	1000	yes	
1999	Mercer	Tindall Farm	1000	c	
1999	Mercer	Veterans Park	13000	yes *	yes
1999	Middlesex	Astro Moulding	1000	yes	
1999	Middlesex	Fuddruckers	4000	yes	
1999	Middlesex	Midstate Mall	2000	yes	
1999	Middlesex	Phoenocian Market	1000	yes	
1999	Morris	Schooley's Mtn. Road	1000	no visit	
1999	Morris	Town & Country Diner	1500	no	
1999	Monmouth	Wooden Nickel Saloon	1500	yes	yes
1999	Monmouth	Shark River Place	2500	yes	yes
1999	Monmouth	Burger King	1000	yes	yes
1999	Monmouth	Howell Storage	2500	c	
1999	Monmouth	Our Lady Star Of The Sea Church	14000	yes	
1999	Monmouth	Mayfair Hotel	500	no	
1999	Monmouth	Manasquan Elks Lodge	2000	yes	yes
1999	Monmouth	Sweetwater Inn	2000	yes	yes
1999	Monmouth	Route 9 Exxon Station	500	no	
1999	Monmouth	Route 9 Days Inn	1500	no	yes
1999	Monmouth	Aberdeen Fire Company	4000	yes	
1999	Monmouth	Beachview Condos.	5500	yes	yes
1999	Monmouth	Route 36 Burger King	1500	yes	
1999	Monmouth	Hot Dog Bobs	500	no	
1999	Monmouth	Mike's Subarine Sandwiches	2000	yes	
1999	Ocean	Upper Shores/Lavallette Branch Library	4500	yes	
1999	Ocean	Sea Spray Motel	500	yes	

1999	Ocean	Nino's Italian Restaurant	1000	no	
1999	Ocean	Cornor Landscaping 4th - 7th	3000	yes	
1999	Ocean	Beacon Garden Apts.	5000	yes *	yes
1999	Ocean	Ocean Pest Consultants	1000	no visit	
1999	Ocean	Port Hole Café	2000	yes *	
1999	Ocean	Polly's Ice Cream	3000	yes	
1999	Ocean	Saint Catherine Of Sienna R.C. Church	500	yes	
1999	Ocean	The Kite Store	500	c	
1999	Ocean	Georgetown Manor	500	yes	
1999	Ocean	Bill's Diner	2500	yes	
1999	Somerset	Executive Days Inn	1000	a	
1999	Somerset	Hillsborough Business Park	1000	no	
1999	Somerset	Tigers Tale Restaurant	1000	c	
1999	Warren	Doctors Park	1500	yes	yes
1999	Warren	Oakwood Lanes	1000	yes	
Totals		85	174800	49	15

a-plants free of scale, b-plants severely pruned, c-plants removed after release, d-plants removed found on adjacent plant e-site sprayed

* supplemental releases